

REMARKS

Claims 1, 4, and 22-50 are pending in the present application; claims 31-50 have been withdrawn from consideration. Applicant has amended claims 1, 4 and 23 to include limitations found in paragraphs [0019] and [0034] of the specification. No new matter has been presented.

Reconsideration of the claims is respectfully requested.

CLAIM REJECTIONS

(Par. 4) 35 U.S.C. 112, First Paragraph Rejection

The Examiner has rejected claims 1, 4 and 22-30 under 35 U.S.C. 112, first paragraph, as lacking enablement. The Examiner asserts that the specification refers to graphitized carbon being present in an amount of up to 15% rather than to graphitized carbon that is produced from graphitizable carbon precursor present in a positive amount up to 15% by weight.

Applicant notes that paragraph 34 of the specification refers to the graphitizable carbon bonding precursor being present in an amount expressed by a range having 15% by weight as an alternative upper limit. This recitation provided support, as stated in the previous Amendment, for claims reciting the amount of graphitizable carbon present in terms of graphitizable carbon precursor used in its production. Applicant also notes that the claims as currently presented refer to a product containing graphitizable carbon, rather than to a product containing graphitized carbon. Paragraphs 17 and 53 of the specification support the characterization of the product of the invention as containing graphitizable carbon.

For these reasons, the rejection of claims 1, 4 and 22-30 under 35 U.S.C. 112 as lacking enablement is believed to have been overcome.

(Par. 5) 35 U.S.C. 112, First Paragraph Rejection

The Examiner has rejected claims 1, 4 and 23-30 under 35 U.S.C. 112, first paragraph, as lacking enablement. The Examiner asserts that the claims refer to the use of graphitizable carbon precursor in a positive amount of up to 15% by weight, and that the specification does not refer to a positive amount for this component.

Accordingly, claims 1 and 4 have been amended to recite a range for the percentage by weight of graphitizable carbon present. The minimum weight percentage in this range is 2 weight percent. Support for this limitation is found in paragraph 34 of the specification.

Applicant also notes that the claimed product contains graphitizable carbon rather than graphitized carbon. Paragraphs 17 and 53 of the specification support the characterization of the product of the invention as containing graphitizable carbon.

For these reasons, this rejection of claims 1, 4 and 23-30 under 35 U.S.C. 112 as lacking enablement is believed to have been overcome.

(Par. 6) 35 U.S.C. 112, First Paragraph Rejection

The Examiner has rejected claims 1, 4 and 22-30 under 35 U.S.C. 112, first paragraph, as lacking enablement. The Examiner asserts that the specification provides support for firing foam at a temperature in the range from 500 to 1000 degrees Celsius, does not provide enablement for firing impregnated foam outside this range.

Accordingly, claims 1, 4 and 23 have been amended to limit firing conditions to the range of from 500 to 1000 degrees Celsius. Support for this amendment is found in paragraphs 19, 29 and 31 of the specification.

For these reasons, this rejection of claims 1, 4 and 22-30 under 35 U.S.C. 112 as lacking enablement is believed to have been overcome.

(Par. 8) 35 U.S.C. 102(e) Rejection With Respect To Bell ‘047

The Examiner has rejected claims 1, 4 and 22-30 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent Publication No. 2007/0090047 A1 by Bell et al. (“the ‘047 reference”) The Examiner asserts that the ‘047 reference teaches, in claims 23-33, the present invention. The Examiner asserts that this reference has a 102(e) date of August 28, 2001, which is earlier than Applicant’s priority date of September 1, 2001.

Applicant maintains that the ‘047 reference should not be accorded, in its entirety, a 102(e) date of August 28, 2001. Claims 23-53 were introduced by amendment on January 8, 2007. These claims contain material that is not supported in the specification. The composition recited in claim 45, for example, has no antecedent basis in the specification.

The application as originally filed by Bell teaches a minimum of 25% binder (see paragraph 17). Accordingly, Applicant has amended the present claims to recite a maximum of graphitizable carbon in terms of a range (2 wt% to 15 wt%) of graphitizable carbon precursor. According to the conservation of mass principles on which chemistry is based, the amount of graphitizable carbon produced is limited by the amount of graphitizable carbon precursor. The

currently claimed maximum values for graphitizable carbon precursor and graphitizable carbon are thus outside the range disclosed by Bell.

The Affidavit presented herewith contains a showing that a) Bell does not teach or imply the distinction in starting materials and composition ranges that yields filters according to the present invention, b) filters produced according to the present invention are distinguishable by analytical techniques from those produced according to the teachings of Bell, c) the filters of the present invention have properties and yield benefits that are not observed in filters manufactured according to the teachings of Bell, and d) usable filters containing 2 wt% to 15 wt% graphitizable carbon can be obtained according to the present invention, but not according to the teachings of Bell.

For these reasons, the rejection of claims 1, 4, and 22-30 as anticipated by the ‘047 reference is believed to have been overcome.

(Par. 9) 35 U.S.C. 102(e) Rejection With Respect To Bell ‘084

The Examiner has rejected claims 1, 4 and 22 under 35 U.S.C. 102(e) as being anticipated by U.S. Patent No. 7,138,084 B2 to Bell et al. (“the ‘084 patent”). The Examiner asserts that the ‘084 reference teaches a ceramic filter for molten metal filtration comprising a ceramic powder and fibers bonded by a network of graphitizable carbon, and the use of a process substantially identical to that described on pages 9-10 of the present specification to form a network of graphitized carbon.

However, the network of carbon taught in the ‘084 patent does not have the same composition as that taught in the present application. As is shown in the ‘084 patent at col. 5, lines 31-38, the ‘084 inventors did not envision a composition containing less than 25% bonding material. The present claims have been amended to recite a maximum of graphitizable carbon in terms of a range (2 wt% to 15 wt%) of graphitizable carbon precursor. According to the conservation of mass principles on which chemistry is based, the amount of graphitizable carbon produced is limited by the amount of graphitizable carbon precursor. The currently claimed maximum values for graphitizable carbon precursor and graphitizable carbon are thus outside the range disclosed by Bell. This limitation finds support on in paragraph [0034] of the specification.

The Affidavit presented herewith contains a showing that a) Bell does not teach or imply the distinction in starting materials and composition ranges that yields filters according to the present invention, b) filters produced according to the present invention are distinguishable by analytical techniques from those produced according to the teachings of Bell, c) the filters of the present invention have properties and yield benefits that are not observed in filters manufactured according to the teachings of Bell, and d) usable filters containing 2 wt% to 15 wt% graphitizable carbon can be obtained according to the present invention, but not according to the teachings of Bell.

For these reasons, the rejection of claims 1, 4, and 22 as anticipated by the ‘084 reference is believed to have been overcome.

(Par. 11) 35 U.S.C. 102(b) or 35 U.S.C. 103(a) Rejection With Respect To Wismer

The Examiner has rejected claims 1, 4, 22, 24-26, 27 and 29 under 35 U.S.C. 102(b) or 35 U.S.C. 103 (a) as being anticipated by, or obvious over, U.S. Patent No. 3,574,646 to Wismer et al. (“Wismer”). The Examiner asserts that Wismer teaches a ceramic filter comprising a ceramic powder and fibers bonded by a network of graphitizable carbon wherein a network of graphitizable carbon is formed by heating a mixture of ceramic powder and fibers with organic resin binder at a high temperature in a range of about 800 – 1600 degrees Fahrenheit, which transforms the mixture into a foamed char inherently having a network of graphite carbons.

Although Wismer’s disclosure contains the word “filter,” no usable filter is disclosed. Even after heating of the charred foam and the burning out of charred unsaturated polyester resin, the product (col. 3, lines 34-36) is a “coherent, strong, cellular inorganic foam structure containing a substantial percentage of closed cells.” A substantial percentage of closed cells would preclude using the article as an effective filter.

In addition, Wismer teaches the use of larger percentages of organic materials than are used in the present invention. Wismer teaches the use of “about equal amounts of the organic material and the inorganic material” (col. 11, lines 28-29) to produce foams. Wismer contains no teaching of the use of an organic component of less than about 15 percent. As has been shown in the accompanying Affidavit, an increased organic component is associated with distortion on curing, which affects the ability to form a filter.

Also, Wismer makes no explicit or implicit reference to a filter containing a network of graphitizable carbon. Contrary to the Examiner's assertions, Wismer does not use the term "graphitizable carbon."

The Examiner refers to a description, in pages 9-10 of the present specification, to the formation of a network of graphitized carbon. As was stated in an Affidavit, it has been found, both experimentally and by reference to the scientific literature, that the synthetic conditions described in the present application produce graphitizable, rather than graphitized, carbon. The temperatures of the disclosed process have been found to be insufficiently elevated to convert significant amount of graphitizable carbon to graphitized carbon. Therefore, to characterize the product unambiguously, claims 1 and 4 were previously amended to claim the product in terms of the process by which the filter is produced.

Contrary to the Examiner's assertion in the Office communication of June 18, 2008, the present process is not substantially identical to the Wismer process. Wismer's process differs from that of the present invention, and yields a different product. Wismer uses higher temperatures and a blowing agent, does not teach the use of an inert or reducing atmosphere, and produces a char rather than graphitizable carbon. Char is not graphitizable carbon (see the Affidavit of the inventor filed on October 29, 2007). The use of an inert or reducing atmosphere is not obvious from Wismer, as it would produce a different product.

Claims 22, 24-26, 27 and 29 depend from claim 1 or claim 4. They are also directed to a product manufactured from graphitizable carbon fired in a non-oxidizing atmosphere at a temperature in the range from 500 degrees Celsius to 1000 degrees Celsius, which can likewise be distinguished from the Wismer product. For these reasons, the rejection of claims 1, 4, 22, 24-26, 27 and 29 as anticipated by Wismer is believed to have been overcome.

(Par. 12) 35 U.S.C. 102(b) or 35 U.S.C. 103 (a) Rejection With Respect To Gadkaree

The Examiner has rejected claims 1, 4 and 22-30 under 35 U.S.C. 102(b) or 35 U.S.C. 103 as being anticipated by, or obvious over, U.S. Patent No. 5,750,026 to Gadkaree et al. ("Gadkaree"). The Examiner asserts that Gadkaree teaches a ceramic filter comprising a ceramic powder and fibers bonded by a network of graphitizable carbon wherein a network of graphitizable carbon is formed by heating a mixture of ceramic powder and fibers with organic

resin binder at a high temperature in a range of about 600-1000°C which creates a network of graphite structure by phenolic resole resin.

Applicant notes that Gadkaree teaches a network of graphite structure. Graphite is graphitized carbon and differs from the carbon contained in the filter of the present invention, which has been found to be composed of graphitizable carbon.

The product of the present invention is currently claimed in terms of a process. Contrary to the Examiner's assertion in the Office communication of June 18, 2008, the process of the present invention differs from that of Gadkaree. The production of the Gadkaree filter differs from that producing the filter of the present invention in that it includes (col. 7, lines 10-19) an activation step. Activated carbon is a required component (see claims 1, 9 and 11) of the filter claimed by Gadkaree. Gadkaree teaches activation by methods such as exposing the structure to an oxidizing agent such as steam, carbon dioxide, metal chloride (e.g., zinc chloride), phosphoric acid, or potassium sulfide, at high temperatures (e.g., about 600°C to about 1000°C). Gadkaree does not teach or suggest the use of a non-oxidizing or reducing atmosphere in the activation step. Using a non-oxidizing or reducing atmosphere in this step would be counterproductive, as it would inhibit the desired oxidation process. This step removes amorphous carbon. The carbon remaining in the Gadkaree filter is in the form of graphitic platelets (graphitized rather than graphitizable carbon). Gadkaree does not teach the use of unactivated carbon as a filter. The Gadkaree product is therefore distinguishable from the product of the present invention both in terms of composition and in terms of enumerated production steps. Because of this difference in terms of enumerated production steps, no "persuasive evidence" is needed to distinguish the Gadkaree procedure from that of the present invention.

Claims 22-30 depend from claims 1 and 4. They are also directed to a product manufactured from graphitizable carbon fired in a non-oxidizing atmosphere at a temperature up to 1000°C, which can likewise be distinguished from the Gadkaree product. For these reasons, the rejection of claims 1, 4, and 22-30 as anticipated by Gadkaree is believed to have been overcome.

(Par. 14) 35 U.S.C. 101 Rejection With Respect To Bell ‘047

The Examiner has provisionally rejected claims 1, 4 and 22-30 under 35 U.S.C. 101 as claiming the same invention as that of claims 23, 24 and 25-33 of copending U.S. Patent Application No. 11/584,002 or U.S. Patent Publication No. US2007/0090047 A1 to Bell et al.

The Affidavit presented herewith contains a showing that a) Bell does not teach or imply the distinction in starting materials and composition ranges that yields filters according to the present invention, b) filters produced according to the present invention are distinguishable by analytical techniques from those produced according to the teachings of Bell, c) the filters of the present invention have properties and yield benefits that are not observed in filters manufactured according to the teachings of Bell, and d) usable filters containing 2 wt% to 15 wt% graphitizable carbon can be obtained according to the present invention, but not according to the teachings of Bell.

As was explained in response to the 35 U.S.C. 102 rejection with respect to the ‘047 application, the ‘047 application is not, in pertinent part, prior art to the present application. For these reasons, the provisional rejection of claims 1, 4 and 22-30 under 35 U.S.C. 101 is believed to have been overcome.

(Par. 16) Rejection For Obviousness-Type Double Patenting With Respect To Bell ‘084

The Examiner has provisionally rejected claims 1, 4 and 22 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2 and 7 of U.S. Patent No. 7,138,084 B2 to Bell et al. (“the ‘084 patent”). The Examiner asserts that claims 1,2 and 7 of the ‘084 patent fully suggest claims 1, 4 and 22 of the present application.

Applicant notes that there is no support in the specification of the ‘084 patent for any composition containing less than 25% bonding material. The claims of the present application have been rewritten, and are now directed to compositions containing a maximum of 15% bonding material.

The Affidavit presented herewith contains a showing that a) Bell does not teach or imply the distinction in starting materials and composition ranges that yields filters according to the present invention, b) filters produced according to the present invention are distinguishable by analytical techniques from those produced according to the teachings of Bell, c) the filters of the present invention have properties and yield benefits that are not observed in filters manufactured

according to the teachings of Bell, and d) usable filters containing 2 wt% to 15 wt% graphitizable carbon can be obtained according to the present invention, but not according to the teachings of Bell.

For these reasons, it is believed that the provisional rejections of claims 1, 4 and 22 for nonstatutory obviousness-type double patenting over the ‘084 patent are believed to have been overcome.

(Par. 17) Rejection For Obviousness-Type Double Patenting With Respect To Juma ‘449

The Examiner has provisionally rejected claims 4 and 26 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2 and 7 of copending U.S. Patent Application No. 10/516,438 and U.S. Patent Publication No. 2005/0263449 A1 to Juma (“the ‘449 publication”). The Examiner asserts that claims 1, 2 and 7 of U.S. Patent Application No. 10/516,438 or the ‘449 publication fully suggest claims 4 and 26 of the present application.

Applicant notes that claims 1, 2 and 7 of the ‘449 publication are directed to a device containing a number of features, such as sieve plates, a reservoir chamber and a corrugated surface, that are not found in the present invention. The ‘449 publication teaches the utility of a device, composed of a particular substance, having a particular configuration claimed in detail. The ‘449 publication is directed to the combination of configuration and composition. It is not directed to, and does not suggest, the general utility of a filter composed of the particular composition. Anticipation is clearly absent. The general use of a material in a filter is not a variation of a filter having a number of design features that incorporates the material, so obviousness is absent. The criteria set forth in MPEP 804 for nonstatutory obviousness-type patenting are thus not met. For these reasons, it is believed that the rejection of claims 4 and 26 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 12, 20 and 21 of copending U.S. Patent Application No. 10/516,438 and U.S. Patent Publication No. 2005/0263449 A1 to Juma (“the ‘449 publication”) has been overcome.

(Par. 18) Rejection For Obviousness-Type Double Patenting With Respect To Bell ‘857

The Examiner has provisionally rejected claims 4 and 22 on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 2 and 7 of copending

U.S. Patent Application No. 10/362,751 or U.S. Patent Publication No. 2004/0128857 A1 (“the ‘857 publication”). The Examiner asserts that claims 1, 2 and 7 of the ‘857 publication suggest claims 4 and 26 of the present application.

Applicant notes that there is no support in the specification of the ‘084 patent for any composition containing less than 25% bonding material. The claims of the present application have been rewritten, and are now directed to compositions containing a maximum of 15% bonding material.

The Affidavit presented herewith contains a showing that a) Bell does not teach or imply the distinction in starting materials and composition ranges that yields filters according to the present invention, b) filters produced according to the present invention are distinguishable by analytical techniques from those produced according to the teachings of Bell, c) the filters of the present invention have properties and yield benefits that are not observed in filters manufactured according to the teachings of Bell, and d) usable filters containing 2 wt% to 15 wt% graphitizable carbon can be obtained according to the present invention, but not according to the teachings of Bell.

For these reasons, it is believed that the provisional rejections of claims 4 and 22 for nonstatutory obviousness-type double patenting over the ‘857 publication are believed to have been overcome.

Applicant respectfully submits that claims 1, 4 and 22-30 are patentable over the prior art. Early and favorable action is earnestly solicited.

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